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ABSTRACT

During the last decade, the attributional aproach to achievement motivation has evolved into a powerful theory of motivated classroom behavior. Causal attributions, and their dimensional nature, are seen as influencing achievement behaviors through their effects on the expectations that individuals hold for outcomes in future achievement situations and on the affective reactions that individuals experience as a result of academic successes and failures. This study investigated the cross-content consistency of attributions to an expanded range of school subjects. Content areas included were reading, writing, mathematics, social studies, and science. Consistency of four attributions--ability, effort, task ease/difficulty, and luck--across the different content areas was examined. Subjects were fifth grade students (N=109) from two public elementary schools. Results of the study indicated that attributions to effort and luck were the most consistent, while attributions to ability and task difficulty appeared to be the most content-specific. Gender-related differences in children's attributions were largely absent, with the exception of attributions to luck. Analysis of attributions within content domains indicated that attributions to effort were most prominent, particularly for successful outcomes. (ABL)

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Consistency of Children's Causal Attributions Across Content Domains

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Abstract

This research involved an exploration of the consistency of four causal attributions (ability, effort, task ease/difficulty, and luck) for successful and unsuccessful outcomes across five academic content domains commonly found in the elementary school curriculum. The results of the study indicated that attributions to effort and luck were the most consistent, while attributions to ability and task difficulty appeared to be the most content-specific. Gender-related differences in children's attributions were largely absent, with the exception of attributions to luck. Analysis of attributions within content domains indicated that attributions to effort were most prominent, particularly for successful outcomes. Results are discussed in relation to theory, classroom practice, and directions for future research.

During the last decade, the attributional approach to achievement motivation (Weiner, 1985) has evolved into a powerful and much-studied theory of motivated classroom behavior, and has been responsible for the generation of volumes of research. Initially conceived as a refinement of the locus of control notion, the theory has grown to include three specific causal dimensions (locus of causality, stability, and controllability) according to which virtually all causal perceptions can be classified. In addition, Weiner (1985) lists intentionality and globality as important properties of attributions. Globality, or the degree to which attributions generalize across situations, is a particularly significant factor in the generalization of the learned helplessness condition (Abramson, Seligman, & Teasdale, 1978).

Causal attributions, and their dimensional nature, are seen as influencing achievement behaviors through their effects on the expectations that individuals hold for outcomes in future achievement situations and on the affective reactions that individuals experience as a result of academic successes and failures. Underlying causal schemata, reflecting the attributional dispositions of the individual, influence more immediate situational explanations for success and failure. Both situational attributions and more generalized causal schemata serve as important sources of information that individuals process in the course of making decisions regarding the course of future behaviors (Kelley & Michela, 1980, Weiner, 1985).

Relatively few studies have explored the consistency of children's attributions across academic situations. Several researchers (Ball, 1984, Stipek & Weisz, 1981) have stressed the significance of this avenue of study. If attributions for success and failure are found to differ systematically in different content areas, then it may be appropriate for teachers to focus attribution training efforts in content areas likely to elicit maladaptive attribution patterns while limiting their concern with attributions in other areas. On the other hand, if students' perceptions are dominated by attributions of a more global nature that generalize across content areas, then students might reap the most benefit from classroom practices which incorporate more generalized attribution training. Further, if maladaptive attribution patterns (particularly attributions to ability for failure and external attributions for success) generalize across content domains, then children exhibiting learned helplessness (Dweck & Licht, 1980) might be expected to exhibit debilitated academic performance in a range of school subjects, rather than in a specific subject area. In any case, knowledge of the consistency and generalizability of children's attributions is an important step toward the application of attribution theory to teaching practices designed to maximize classroom achievement motivation.

Frieze and Snyder (1980), in an investigation of attribution patterns in various school-related settings, used an open-ended measurement technique to assess elementary school students' attributions for success and failure of a hypothetical male student in four situations (testing, an art project, playing football, and catching frogs). Their results suggested that students'

attributions differed for the four situations, with the testing situation eliciting the strongest attributions to effort and, to a lesser extent, to ability. Effort was seen as a particularly important cause of success and failure in all four of the situations. The authors concluded that, as early as first grade, children develop beliefs about the factors that cause success and failure in specific situations.

In a study conducted in Israel, Bar-Tal, Raviv, Raviv, and Bar-Tal (1982) examined the consistency of attributional patterns of sixth-graders over the course of a trimester on two tests in the same and different subjects. Subject areas involved were mathematics, the bible, and geography. They found that attribution patterns were relatively consistent both within and across subject areas. Consistency of attributions was greatest when outcomes were perceived to be the same (i.e., success-success or failure-failure). Their interpretation of the observed cross-subject attributional consistency was that students may have perceived the achievement situations as being more similar (i.e., classroom tests) than different even though different subject areas were involved. The authors reasoned that given such a perception, children's attributions were likely shaped by preexisting causal schemata.

Marsh and his colleagues (Marsh, 1984, Marsh, Relich, Cairns, & Smith, 1984), in studies of the relationships between self-attributions, self-concept, and achievement, found evidence that attributions to external causes and effort generalized across content areas, while attributions to ability seemed to be more content-specific. Attributions for outcomes in mathematics,

reading, and a general school category were addressed. Marsh (1984) reasoned that the content-specificity of attributions to ability may be due to the fact that, while effort in one content area may predict effort in others, ability in a specific content area says little about ability in other, unrelated content areas.

A related area of investigation involves the differential attributional perceptions of boys and girls across subject areas. In general, girls have been found to exhibit less adaptive attribution patterns than boys, particularly in response to their successes and failures in mathematics (McMahan, 1982, Ryckman & Peckham, 1987a,1987b, Stipek, 1984). Girls have been found to be more likely than boys to attribute their failures in math to ability, and to externalize responsibility for their successes. While the reverse situation might be hypothesized for verbal areas, where girls might be predicted to excel, such effects have not been reliably observed.

Stipek (1984) postulated that observed sex differences in attributions may be due to differences in perceived competence in different areas. Boys are perceived to be more competent in mathematics than girls. On the other hand, Dweck and Licht (1980) have suggested that the task characteristics associated with specific content areas may differentially affect helpless and mastery-oriented children. They hypothesized that outcomes in mathematics, as opposed to verbal areas, are more easily interpretable in terms of ability. Given differential evaluative feedback patterns for boys and girls (Dweck, Davidson, Nelson, & Enna, 1978), the result is a potentially harmful pattern of attributions for girls.

The present study was designed to extend the investigation of cross-content consistency of attributions to an expanded range of school subjects. Content areas included in this study - reading, writing, math, social studies, and science - are commonly found in the elementary school curriculum. Consistency of four attributions - ability, effort, task ease/difficulty, and luck - across the different content areas was examined. In addition, the relative strength of the various attributions within content areas was examined. Given the gender related differences reported for attributional patterns in some subject areas, subject sex was also a variable of interest.

Method

Subjects

Subjects for this study were 109 fifth grade students from two public elementary schools in a small southwestern city. The sample was chosen to reflect the overall socioeconomic and racial composition of the school district. In all, students in five intact classrooms participated in the study. Although participation in the study was voluntary, all students present on the day of data collection took part.

Of the 109 subjects, 64 were White (33 males, 31 females), 39 were Black (24 males, 15 females), and 6 were Hispanic (3 males, 3 females). Mean age of males in the sample (n=60) was 11.12. Mean age of females (n=49) was 11.07.

Procedure

Data were collected in February of 1988. After identifying schools and classrooms, teachers were interviewed to inform them of the requirements of the study and to insure that their students were familiar with the rating scale methodology to be employed.

Data from each classroom were collected by a male experimenter. Subjects were told that the experimenter was going to ask them some questions about "Why you do well or do poorly in different subjects", and that there were "no right or wrong answers to the questions." Subjects were told that their responses were confidential, and that they were not to write their names on their papers. They were then given a number-coded copy of the scales and given verbal instructions while they read along. Subjects completed one practice item regarding causes of success and failure in playing games prior to administration of the scales.

In order to compensate for differences in reading level, the scale items were read aloud by the researcher while subjects read along. Administration of the scales took approximately thirty minutes, and was accomplished in one sitting.

Measure of Subject-Specific Attributions

The instrument employed in this study consists of 40 five-point rating scales divided into five content-specific subscales. Content areas included are reading, writing, mathematics, social studies, and science. Attributions assessed are ability, effort, task ease/difficulty, and luck for both successful and unsuccessful outcomes. Content specific subscales were

randomly ordered for each administration of the scale (i.e., for each intact classroom) to compensate for possible order effects. Order of items within the subscales was assigned randomly, but was consistent across the subscales, the only difference between subscales being the substitution of different content area descriptors.

Subjects are asked to rate the frequency with which they attribute outcomes in different content areas to given causes. This type of measure was used in order to probe generalized attributional perceptions rather than reactions to a specific situation. Students' ratings were interpreted as an indication of the strength of the various attributions within each content area.

Each item asks a question regarding the frequency that a cause is responsible for the respondent's success or failure in a given content area. (For instance, "When you do well in math, how often is it because you are good at math?"; "When you do poorly in social studies, how often is it because you do not try hard enough in social studies?") Immediately below the question is a five point rating scale. Increments along the scale are indicated by the numbers one through five within circles of increasing size. The endpoints of the scale indicate "never" and "always", while the intermediate points indicate "some of the time", "about half of the time", and "most of the time". The format employed is a development of methodology used by Lewis and Cooney (1987) to assess attributions specific to computer-assisted mathematics instruction, and is designed to give respondents verbal, numerical, and visual referents to the incremental

nature of the scale.

The choice of a rating scale format for the assessment of attributions was guided by evidence which suggests that such measures possess superior psychometric properties (Elig & Frieze, 1979) and are appropriate for children of the age involved in this study (Frieze, Francis, & Hanusa, 1983). Stability of the scale items was checked with a subgroup of the subject sample (n=19). Percent exact agreement of individual scale items over a two week interval ranged from a low of 31.6 to a high of 84.2, with a mean of 55.2. Percent agreement plus or minus one scale point ranged from 63.1 to 100 with a mean of 90.8.

Results

Attributions Across Content Domains

Consistency of attributions across content domains was examined in two stages. First, correlations were computed between attributions within each content domain. Attributions for both successful and unsuccessful outcomes were included in these analyses. Correlation matrices are presented in Tables 1 through 4. Following this, differences in attributions across the various content domains were analyzed using a 5 X 2 X 2 (content X outcome X sex) repeated measures analysis of variance (ANOVA). Content domain and outcome served as within-subject variables, while sex was a between-subject variable. Analyses were conducted for each of the four attributions studied. Given a significant F statistic, post hoc multiple comparisons were conducted using Tukey's Honestly Significant Difference (HSD) procedure.

Insert Tables 1-4 about here

Correlations between attributions to ability, effort, and task ease/difficulty within outcome conditions were generally significant, positive and ranged from low to moderate in magnitude, but correlations between attributions to the same cause across outcome conditions were generally negative or nonsignificant. Thus, children who attributed successes to these causes were not likely to also attribute failures to them. There were several notable exceptions to this trend. Within the attributions to ability, math and social studies were not correlated for either outcome condition. Within the attributions to task difficulty for unsuccessful outcomes, neither reading nor writing was correlated with math, although they were positively correlated with attributions to task ease for successful outcomes in math.

This general pattern did not hold true for attributions to luck. Correlations between luck attributions within outcome conditions displayed the same pattern as those for ability, effort, and task. However, correlations between attributions to luck for successful and unsuccessful outcomes were moderate and positive for all content areas, indicating that children who attributed their successes to luck were just as likely to attribute their failures to luck. This finding may be a reflection of the subjects' perception of luck as an unstable cause, as compared to a

perception of relative stability for attributions to ability, effort, and task difficulty.

A second trend evident in the correlational data was that, for successful outcomes, correlations between attributions to ability in different content areas tended, in general, to be somewhat lower (mean r=.29) than correlations between attributions to effort (mean r=.38), task ease (mean r=.40), or luck (mean r=.54). The pattern for attributions for unsuccessful outcomes was not as clear. Correlations between attributions to ability (mean r=.26) and task difficulty (mean r=.26) were both of generally lower magnitude than attributions to effort (mean r=.37) and luck (mean r=.49).

A summary of the across content domain ANOVAs is presented in Table 5. A consistent finding was a tendency for subjects to make stronger attributions for successful outcomes than for unsuccessful outcomes. This relationship was consistent for both males and females, with the exception of attributions to luck (Figure 1). Females' attributions to luck were significantly stronger for successful outcomes than for unsuccessful outcomes. A corresponding difference was not found for males.

Insert Table 5 about here

Insert Figure 1 about here

There was a significant interaction between outcome and content for the ability (Figure 2) and task ease/difficulty variables (Figure 3). Attributions to ability for successful outcomes were significantly stronger than those for unsuccessful outcomes in all content areas. Subjects made significantly stronger attributions to ability for successful outcomes in mathematics than for successful outcomes in social studies. Attributions to ability for unsuccessful outcomes in reading proved to be stronger than those for unsuccessful outcomes in writing.

Insert Figure 2 about here

Insert Figure 3 about here

Attributions for successful outcomes were also stronger than those for unsuccessful outcomes on the task difficulty/ease variable, with the exception of attributions for outcomes in social studies. Within the attributions for successful outcomes, attributions to task ease for writing and math were significantly stronger than those for social studies. Among attributions for failure outcomes, attributions to task difficulty were significantly stronger for social studies than than for writing.

Taken together, the findings reported here indicate a variable degree of consistency among the four attributions studied. Ability appears to be the

most content-specific of the attributions, at least for successful outcomes, while attributions to luck appear to be the most generalizable.

Attributions Within Content Domains

The relative strength of attributions within the five content domains was also examined. Rank-ordered attribution means for successful and unsuccessful outcomes in the five content areas are presented in Table 6.

Insert Table 6 about here

A series of 4 X 2 (attribution X sex) analyses of variance was performed to determine whether significant differences existed in the strength of attributions within the various content domains. A summary of the ANOVAs is presented in Table 7. Given a significant F statistic, multiple comparisons were conducted using Tukey's Honestly Significant Difference (HSD) procedure. The results of all appropriate multiple comparisons are presented in Table 6 for clarity.

Insert Table 7 about here

Significant main effects for the attribution factor were obtained for successful outcomes in all content areas. As is evident in Table 6, effort attributions proved to be strongest, followed by attributions to ability, task ease, and luck, in that order. Post hoc analyses indicated that mean attribution scores for reading were all significantly different from one

another. Within the writing and science domains, mean attributions to ability and task ease were not significantly different. Within the social studies domain, mean attributions to task ease and luck were not significantly different.

There was also a significant interaction between the attribution and sex factors for successful outcomes in mathematics. Males and females showed no significant differences in attributions to effort, ability, or task ease. Attributions to effort and ability were significantly stronger than those to task ease and luck for both males and females. However, females exhibited significantly stronger attributions to luck than did males.

Insert Figure 4 about here

Attributions for failure outcomes were uniformly lower and considerably less variable than those for successful outcomes. A significant main effect for the attribution factor for writing was evident. Post hoc analysis indicated that attributions to effort were significantly higher than those to task difficulty.

Finally, there was a general tendency for females to express somewhat stronger attributions than males for successful outcomes in verbal areas. This tendency is evidenced by significant main effects for sex collapsed across the attribution factor for three of the five content areas (reading, writing, and social studies).

Discussion

The results of this study suggest that a variable degree of cross-content consistency existed among the four attributions assessed. Attributions to ability and task difficulty were the least consistent, while attributions to effort and luck were the most consistent.

Ability appears to be the most content-specific of the four attributions. Correlations between ability attributions within outcome conditions were generally lower than those for the other attributions. In fact, attributions to ability in math and social studies were not correlated for either successful or unsuccessful outcomes. The results of the ANOVA also indicated that variability existed in strength of attributions to ability among content areas. Math elicited stronger attributions to ability than did social studies for successful outcomes, and reading elicited stronger attributions to ability than did writing for unsuccessful outcomes.

Attributions to task ease/difficulty also exhibited an inconsistent pattern, with attributions to task difficulty for unsuccessful outcomes exhibiting less consistency than attributions to task ease for successful outcomes. This finding may reflect children's differential perceptions of task difficulty in different content areas, a finding reported previously (Eccles, Adler, & Meece, 1984).

Attributions to effort and, particularly, luck appear to be the most generalized of the attributions assessed. Both exhibited higher mean correlations within outcome conditions than those for ability and task

difficulty, while the ANOVAs revealed no significant effects for the content factor.

Taken together, these results provide limited support for the contention of Marsh (1984) and Marsh, et al. (1984) that ability attributions may be more content-specific than attributions to external causes and effort. An important difference in these findings, however, lies in the variability observed in attributions to task difficulty. The primary implication of this finding is that task difficulty should be considered independently of other external attributions.

Another implication of this finding is related to the generalization of the helplessness condition (Abramson, Seligman, & Teasdale, 1978, Dweck & Licht, 1980). If these findings are replicated and attributions to ability prove to be relatively content-specific, the debilitated academic functioning associated with a helpless orientation, with its concomitant focus on ability as a primary cause of failure, may be somewhat limited to specific academic content areas. This would appear to be a promising area for future research.

Ryckman and Peckham (1987a) reported that subjects in their study exhibited stronger attributions to effort in language arts than in math/science, while being more likely to attribute outcomes in math/science than in language arts to task characteristics and luck. The results of this study did not replicate that finding. While attributions for successful outcomes in mathematics collapsed across the sex factor were strongest for ability, they were only significantly stronger than those for

social studies. The same pattern was not present among unsuccessful outcomes, where reading elicited the strongest attributions to ability, although significance was reached only in relation to attributions to ability for writing.

Subjects also reported stronger attributions to task ease for successful outcomes in writing than for successful outcomes in social studies, while reporting the reverse in response to unsuccessful outcomes. These findings, taken together with those discussed above, suggest that children's causal explanations for outcomes in primarily verbal areas may differ in systematic ways and might best be considered separately.

Subjects of this study, regardless of gender, reported substantially stronger attributions for successful outcomes than for unsuccessful outcomes. An often-reported effect in attribution research is the self-serving, or ego-protective, bias (Bradley, 1978, Miller & Ross, 1975, Zuckerman, 1979), in which individuals exhibit ego-defensive attributions after failure, while expressing ego-enhancing attributions after success. In the present study, an outcome bias was evident, but, rather than taking internal responsibility for successes and externalizing failures, subjects here reported less likelihood of invoking any of the attributions assessed for failure than for success. While the significant outcome X content interactions for ability and task ease/difficulty indicate a somewhat uneven pattern of the effect for those attributions, the sole exception to the pattern was found in subjects' attributions to task ease/difficulty for outcomes in social studies.

Previously reported sex differences in attribution patterns were largely absent. Based on previous research (McMahan, 1982, Ryckman & Peckham, 1987a, 1987b, Stipek, 1984), girls might have been expected to exhibit a maladaptive attribution pattern for outcomes in mathematics. Specifically, they might have been expected to be more likely than boys to attribute their successes to external or unstable factors while attributing their failures to internal and stable factors. No such pattern was in evidence for attributions to ability or task. However, girls were more likely to attribute successful outcomes in mathematics to luck than were males. It should also be noted that, overall, girls made significantly stronger attributions to luck for successful outcomes than for unsuccessful outcomes. This finding reflects one of the most consistently reported gender-related effects in the attribution literature (Sohn, 1982), and is indicative of a somewhat maladaptive attribution pattern.

The pattern that emerged from the analysis of attributions within content domains was one of a relatively consistent pattern of attributions that held constant across content domains. For successful outcomes effort was predominant, followed by ability and task ease. Luck was consistently reported as the least frequent cause of success. Effort was also prominent in subjects' explanation of unsuccessful outcomes, although not as clearly. Frieze and Snyder (1980) found that effort and ability were most frequently given as causes of success and failure in somewhat more varied school situations. Indeed, they reported that fully 65% of all codable responses given by the children in their study were related to effort. The results of

this study support that finding. Whitley and Frieze (1985), referring to the earlier work of Covington and Omelich (1979a, 1979b), have suggested that students may view the expenditure of effort as a fundamental expectation of the school environment. As such, students may be predisposed to make attributions to effort regardless of the outcome.

While the results of this study provide a preliminary indication of the relationships between some of the attributions that children may employ to help explain successes and failures in different content areas, many questions remain unanswered. For instance, other individual difference variables may affect children's characteristic attributions in different content areas. Such factors as level of achievement and overall intellectual ability may systematically influence children's beliefs about different subjects. In addition, the content domains examined in this study represent only a part of the classroom reality of the child. The inclusion of other non-academic content areas (e.g., art, music, physical education) in future investigations will provide a more complete picture of the generalizability of children's causal beliefs.

It should also be noted that, while the four attributions assessed here are among the most commonly studied, there are many other possible causes that children may believe to be responsible for their successes and failures (Deiner & Dweck, 1978, Elig & Frieze, 1975). Such things as mood, interest, liking of the subject, and the help/hindrance of others may play

an important role in children's beliefs about different content domains. Future research in this area should explore the role of an expanded range of attributions that children might use in explaining their academic successes and failures.

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Table 1

Correlations Between Attributions to Ability

Attribution/Outcome	1	2	3	4	5	6	7	8	9	10
1. Reading/Successful		.35	.23	.30	.42	-.26	NS	NS	NS	-.21
2. Writing/Successful			.25	.45	.22	NS	NS	NS	NS	-.28
3. Math/Successful				NS	.33	NS	NS	-.28	NS	NS
4. Soc. Studies/Successful					.27	NS	NS	NS	NS	NS
5. Science/Successful						NS	NS	NS	NS	NS
6. Reading/Unsuccessful							.38	.27	.30	.20
7. Writing/Unsuccessful								.19	.28	.29
8. Math/Unsuccessful									NS	.29
9. Soc. Studies/Unsuccessful										.38
10. Science/Unsuccessful										

Note. NS = Not significant at $p < .05$.

Table 2

Correlations Between Attributions to Effort

Attribution/Outcome	1	2	3	4	5	6	7	8	9	10
1. Reading/Successful		.41	.35	.48	.30	NS	NS	NS	NS	NS
2. Writing/Successful			.24	.41	.31	NS	NS	NS	NS	NS
3. Math/Successful				.37	.43	-.27	NS	-.19	NS	-.21
4. Soc. Studies/Successful					.50	NS	NS	NS	NS	NS
5. Science/Successful						NS	NS	NS	NS	NS
6. Reading/Unsuccessful							.37	.32	.47	.43
7. Writing/Unsuccessful								.28	.34	.44
8. Math/Unsuccessful									.53	.25
9. Soc. Studies/Unsuccessful										.31
10. Science/Unsuccessful										

Note. NS = Not significant at $p < .05$.

Table 3

Correlations Between Attributions to Task Ease/Difficulty

Attribution/Outcome	1	2	3	4	5	6	7	8	9	10
1. Reading/Successful		.51	.36	.38	.43	NS	NS	NS	NS	NS
2. Writing/Successful			.38	.39	.48	NS	NS	NS	NS	NS
3. Math/Successful				.39	.26	.25	.20	-.25	NS	NS
4. Soc. Studies/Successful					.48	NS	NS	NS	NS	NS
5. Science/Successful						NS	NS	NS	NS	NS
6. Reading/Unsuccessful							.27	NS	.23	.35
7. Writing/Unsuccessful								NS	.47	.30
8. Math/Unsuccessful									.27	.23
9. Soc. Studies/Unsuccessful										.29
10. Science/Unsuccessful										

Note. NS = Not significant at $p < .05$.

Table 4

Correlations Between Attributions to Luck

Attribution/Outcome	1	2	3	4	5	6	7	8	9	10
1. Reading/Successful		.53	.61	.48	.57	.45	.33	.46	.43	.39
2. Writing/Successful			.57	.57	.46	.35	.45	.22	.25	.30
3. Math/Successful				.64	.57	.57	.40	.32	.35	.32
4. Soc. Studies/Successful					.45	.48	.39	.18	.34	.42
5. Science/Successful						.40	.36	.38	.45	.39
6. Reading/Unsuccessful							.55	.49	.45	.45
7. Writing/Unsuccessful								.42	.52	.53
8. Math/Unsuccessful									.57	.41
9. Soc. Studies/Unsuccessful										.57
10. Science/Unsuccessful										

Note. NS = Not significant at $p < .05$.

Table 5

Summary of Content X Outcome X Sex Repeated Measures Analysis of Variance

		Attribution			
		Ability	Effort	Task	Luck
Source	df	F	F	F	F
Sex	1	.35	.71	1.06	2.77
Error	107				
Outcome	1	165.68**	279.28**	77.14**	42.78**
Outcome X Sex	1	.01	3.44	.25	4.90*
Error (Outcome)	107				
Content	4	2.44*	2.30	.47	1.04
Content X Sex	4	1.53	.72	.60	1.25
Error (Content)	428				
Outcome X Content	4	4.21**	1.33	8.82**	.74
Outcome X Content X Sex	4	.53	.63	.22	.13
Error (Outcome X Content)	428				

*$p < .05$ **$p < .01$

Figure 1.

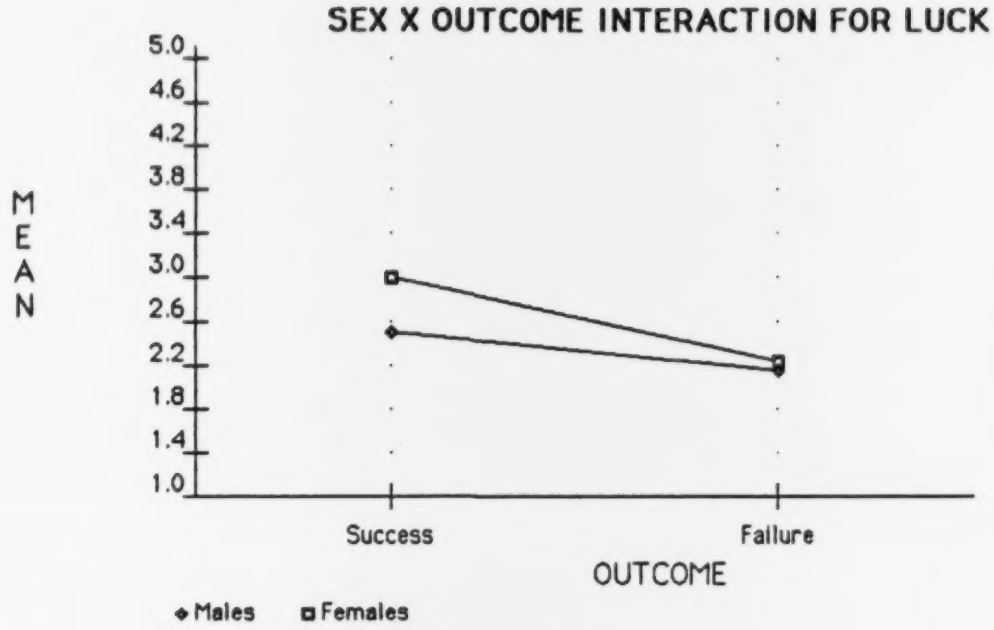

SEX X OUTCOME INTERACTION FOR LUCK
MEAN
5.0
4.6
4.2
3.8
3.4
3.0
2.6
2.2
1.8
1.4
1.0
Success
Failure
OUTCOME
Males
Females

Figure 2.

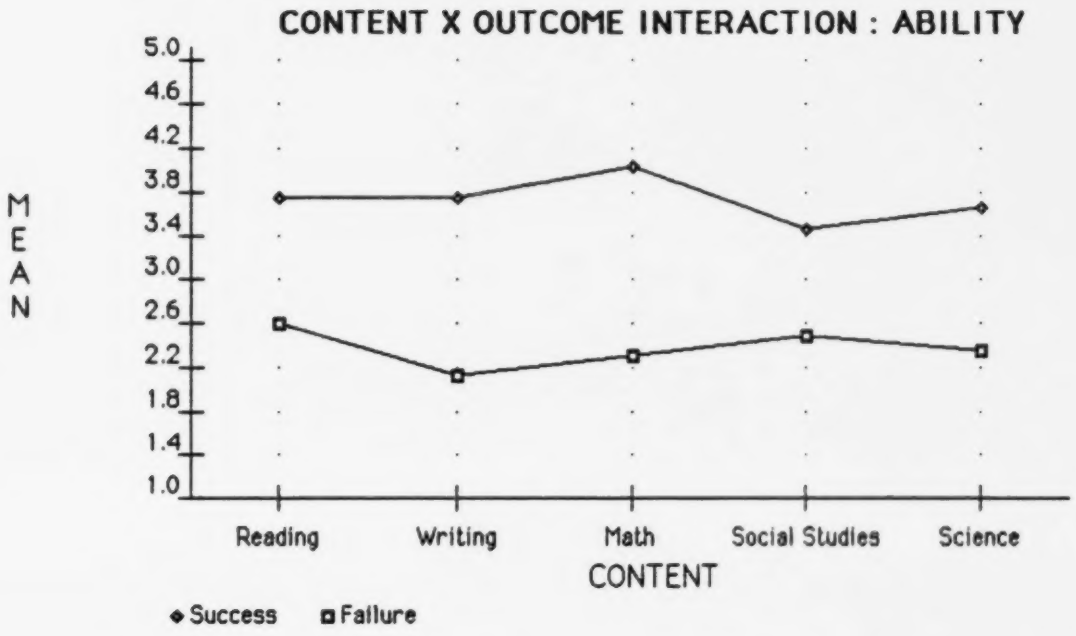


Figure 3.

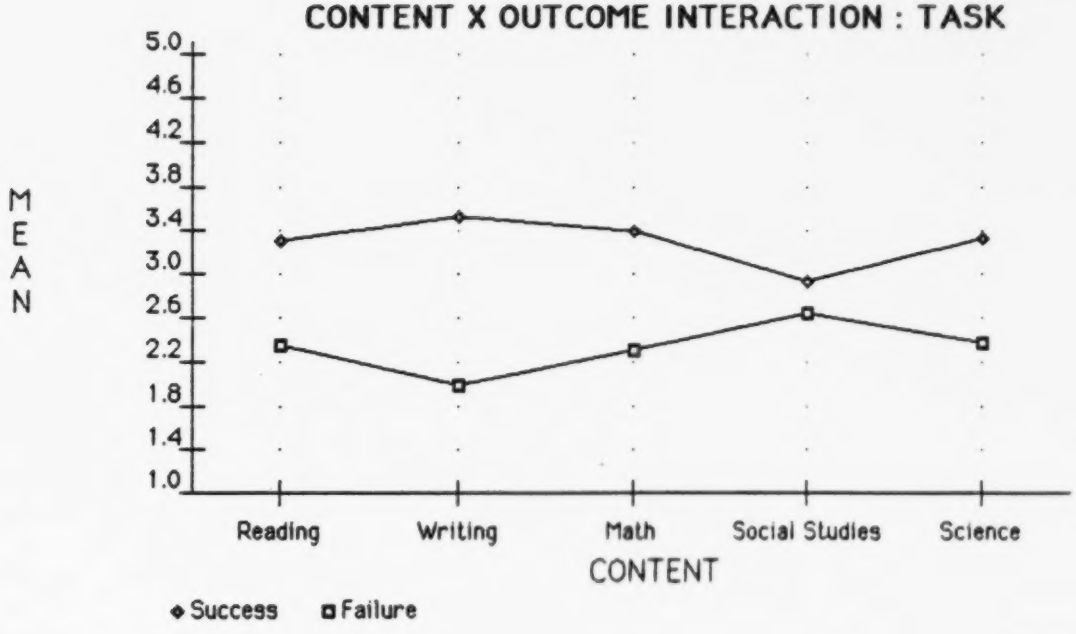


Table 6
Ranked Attribution Means within Content Domains

Content Domain	Attribution			
	Successful Outcomes			
Reading**	Effort	Ability	Task	Luck
	4.257a	3.761b	3.321c	2.694d
Writing**	Effort	Ability	Task	Luck
	4.266a	3.761b	3.523b	2.852c
Math**	Effort	Ability	Task	Luck
	4.420a	4.055a	3.394b	2.824c
Social Studies**	Effort	Ability	Task	Luck
	4.275a	3.468b	2.927c	2.713c
Science**	Effort	Ability	Task	Luck
	4.076a	3.633b	3.330b	2.602c
	Unsuccessful Outcomes			
Reading	Ability	Effort	Task	Luck
	2.592	2.458	2.357	2.211
Writing*	Effort	Luck	Ability	Task
	2.532a	2.2110ab	2.139ab	2.009b
Math	Effort	Ability	Task	Luck
	2.376	2.314	2.302	2.165
Social Studies	Task	Effort	Ability	Luck
	2.651	2.596	2.490	2.275
Science	Effort	Task	Ability	Luck
	2.376	2.376	2.351	2.128

Note. Means with the same subscript are not significantly different at $p < .05$.

*Significant F for attribution factor at $p < .05$.

**Significant F for attribution factor at $p < .01$.

Table 7

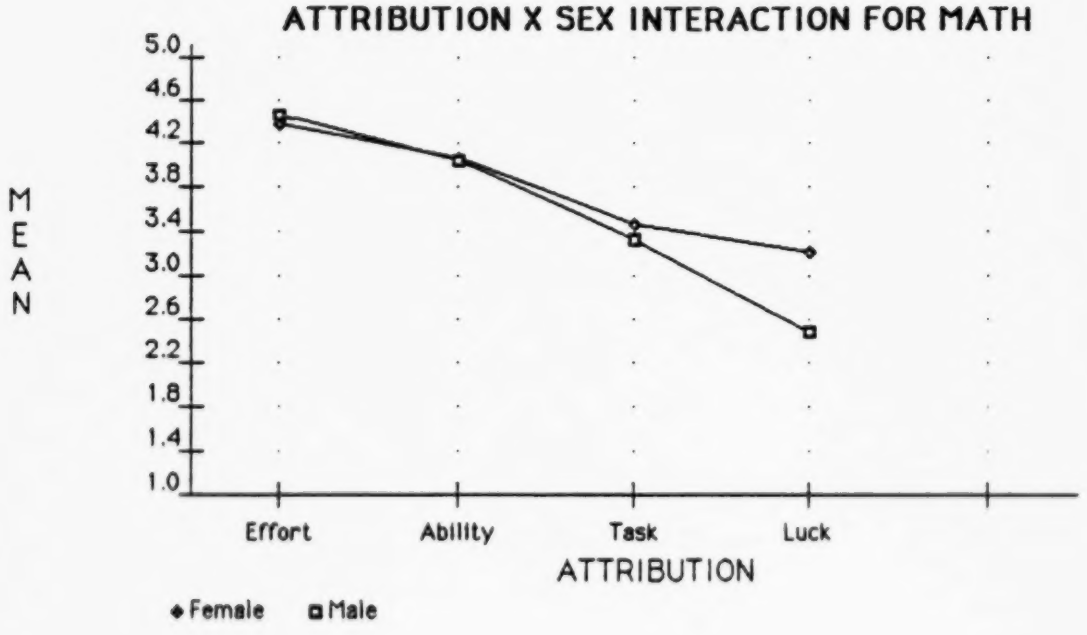
Summary of Attribution X Sex Analysis of Variance within Content Areas

	Source		
Content/Outcome	Attribution[a]	Sex[b]	Attribution X Sex[c]
Reading			
Successful	35.96**	5.26*	0.58
Unsuccessful	0.81	0.30	0.68
Writing			
Successful	25.20**	4.44*	0.74
Unsuccessful	3.66*	0.71	1.21
Mathematics			
Successful	36.51**	2.86	2.58
Unsuccessful	0.41	0.54	1.04
Social Studies			
Successful	38.70**	4.35*	0.24
Unsuccessful	2.00	0.61	1.01
Science			
Successful	28.06**	1.25	1.12
Unsuccessful	1.13	0.30	0.43

df=3,428[a] df=1,428[b] df=3,428[c]

$p<.05$* $p<.01$**

Figure 4.


ATTRIBUTION X SEX INTERACTION FOR MATH
MEAN
5.0
4.6
4.2
3.8
3.4
3.0
2.6
2.2
1.8
1.4
1.0
Effort
Ability
Task
Luck
ATTRIBUTION
Female
Male